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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,369	04/17/2001	Isabelle Harter	PET-1928	5770
23599	7590	07/19/2005		
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			EXAMINER KERN, KEVIN P	
			ART UNIT	PAPER NUMBER
			1725	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/835,369	<b>Applicant(s)</b> HARTER ET AL.	
	<b>Examiner</b> Kevin P. Kerns	<b>Art Unit</b> 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 1/10/05, 2/8/05, and 4/28/05.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 14-24 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5 and 14-24 is/are rejected.
- 7) ☒ Claim(s) 4 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 and 10 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 23 is objected to because of the following informalities: in 14<sup>th</sup> line of the claim, a comma should be added after "at least one element" for further clarity. In the last line and the 4<sup>th</sup> line from the end of the claim, "down comer" should be changed to "downcomer" for spelling agreement with this term in earlier claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation "the downcomer axis" and "the circulation zone".

There is insufficient antecedent basis for these limitations in the claim.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 5, 14-17, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen (US 4,140,625) in view of Hearn et al. (US 5,523,062).

Jensen teaches a subassembly for contact and material distribution of a gas phase and a liquid phase. Jensen teaches that this subassembly can be used for hydrocarbon reactions. The subassembly includes a distributor tray with a plurality of downcomers surmounted by a cap. The downcomers have at least one upper cross section of flow for entry of a gas phase into the downcomer and at least one lower cross section of flow for entry of a liquid phase into the downcomer. Jensen teaches that the downcomers may be positioned so that they extend above and below the tray, that the cross sections for liquid entry are apertures or slots, that there may be more than one cross section for liquid entry above the tray and below the cross section for gas entry, and that the cross section for liquid entry is positioned above the tray to allow for a level of liquid in the tray. Jensen teaches that splash blocks may be positioned below the

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downcomers to effect widespread distribution of material. (column 1, lines 6-35 and 57-61; column 2, lines 38-55; column 8, lines 40-49; column 9, lines 7-14; column 10, lines 29-68; column 11, lines 1-14 and 60-62; column 12, lines 19-44; and Figures 1, 5, 16-18, and 20). Jensen does not teach the use of a packing within the downcomers or the nature of the packing.

However, Hearn et al. teach a distribution structure for distillation that is composed of layers of plates running transverse to the flow of material. Hearn et al. teach that more than one packing can be used in a process. Hearn et al. teach that this packing improves the separation characteristics of distillation columns and that the packing redistributes gas and liquid flow evenly across the column. (Hearn et al.; column 1, lines 8-12; column 2, lines 1-17; and Figures 1 and 6).

It would have been obvious to one of ordinary skill in the art at the time that the applicants' invention was made to have modified the subassembly of Jensen by the teachings of Hearn et al. One would have been motivated to add the packing taught by Hearn et al. in order to improve separation characteristics and allow even distribution of gas and liquid flow, as taught by Hearn et al.

7. Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goebel et al. (US 5,232,283) in view of Jensen (US 4,140,625) and Hearn et al. (US 5,523,062).

Goebel et al. teach a vessel with upper and lower parts, an inlet in the upper part for introducing a liquid fluid and a gaseous fluid, upper and lower catalysts beds, and a

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side inlet for a third fluid. Goebel et al. teach that the side inlet is for a quench gas. (column 3, lines 58-68; column 4, lines 1-19; and Figure 5). Goebel et al. do not teach the use of a subassembly with a packing.

However, Jensen teaches a subassembly for contact and material distribution of a gas phase and a liquid phase. Jensen teaches that this subassembly can be used for hydrocarbon reactions. The subassembly includes a distributor tray with a plurality of downcomers surmounted by a cap. The downcomers have at least one upper cross section of flow for entry of a gas phase into the downcomer and at least one lower cross section of flow for entry of a liquid phase into the downcomer. Jensen teaches that the downcomers may be positioned so that they extend above and below the tray, that the cross sections for liquid entry are apertures or slots, that there may be more than one cross section for liquid entry above the tray and below the cross section for gas entry, and that the cross section for liquid entry is positioned above the tray to allow for a level of liquid in the tray. Jensen teaches that splash blocks may be positioned below the downcomers to effect widespread distribution of material. This reference teaches that this subassembly provides uniform introduction of a vapor/liquid mixed phase to a bed of catalyst particles in mist form while resisting segregation and channeling as the phases move through the bed. (Jensen; column 1, lines 6-35 and 57-61; column 2, lines 38-55; column 8, lines 40-49; column 9, lines 7-14; column 10, lines 29-68; column 11, lines 1-14 and 60-62; column 12, lines 19-44; and Figures 1, 5, 16-18, and 20).

Hearn et al. teach a distribution structure for distillation that is composed of layers of plates running transverse to the flow of material. Hearn et al. teach that more

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than one packing can be used in a process. Hearn et al. teach that this packing improves the separation characteristics of distillation columns and that the packing redistributes gas and liquid flow evenly across the column. (Hearn et al.; column 1, lines 8-12; column 2, lines 1-17; and Figures 1 and 6).

It would have been obvious to one of ordinary skill in the art at the time that the applicants' invention was made to have modified the vessel of Goebel et al. by the teachings of Jensen and Hearn et al. One would have been motivated to use the subassembly of Jensen to provide uniform introduction of a vapor/liquid mixed phase to a bed of catalyst particles in mist form while resisting segregation and channeling as the phases move through the bed, as taught by Jensen. One would have been motivated to add the packing taught by Hearn et al. in order to improve separation characteristics and allow even distribution of gas and liquid flow, as taught by Hearn et al. The examiner notes that the vessel taught above is capable of the uses set forth in claims 19, 21, and 22.

***Allowable Subject Matter***

8. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 23 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

10. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be a nonobvious improvement over the invention patented by Jensen (US 4,140,625). The improvement comprises the last packing is located close to the cross section of flow of the lower portion of the downcomer for dispersing a two-phase or poly-phase mixture in which a portion of the packing is internal to the downcomer and a portion is external to the downcomer (dependent claim 4; and independent claim 23).

### ***Response to Arguments***

11. The examiner acknowledges the applicants' amendments and replacement drawing sheets received by the USPTO on 1/10/05, 2/8/05, and 4/28/05. The replacement drawing sheets are approved, and thus overcome prior objections to the drawings. Prior claim objections have been overcome by the claim amendments. However, new claim objections and rejections under 35 USC 112, 2<sup>nd</sup> paragraph have been introduced into new claim 23. The applicants have added new claims 23 and 24. Claims 1-5 and 14-24 are currently under consideration in the application.

12. Applicants' arguments filed January 10, 2005 have been fully considered but they are not persuasive.

With regard to the applicants' remarks/arguments on pages 9 and 10, the examiner respectfully disagrees with the applicants' assessments of the references.



Jensen sets forth all structural features of independent claims 1 and 24, with the exception of the packing material within the downcomers – this single element which is lacking in Jensen would not be considered as a “major deficiency” by one of ordinary skill in the art, as the applicants suggest in the 1<sup>st</sup> paragraph of page 9 of their remarks. Hearn et al. remedy this deficiency with the packing material that is advantageous for providing improved separation characteristics and allow even distribution of gas and liquid flow. The motivation set forth in the combination of Jensen and Hearn et al. (which are both drawn to similar fields) is considered to be proper, and hence a *prima facie* case of obviousness exists. It is acknowledged that the applicants' remarks on page 10 are silent with regard to the Goebel et al. reference.

### ***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns 7/14/05*  
Primary Examiner  
Art Unit 1725

*KPK*  
kpk  
July 14, 2005